SECTION VII.—WEATHER AND DATA FOR THE MONTH.

THE WEATHER OF THE MONTH.

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PRESSURE.

The distribution of the atmospheric pressure over the United States and Canada and the prevailing direction of the winds are graphically shown on Chart VII, while the average values for the month at the several stations, with the departures from the normal, are shown in Tables I and III.

For the month as a whole the barometric pressure averaged considerably below the normal in all central and southern districts to the eastward of the Rocky Mountains, the greatest minus departures appearing in the east Gulf States, due to the influence of the tropical disturbances that visited those districts during the first two decades of the month. Over the northern sections the pressure averaged slightly above normal quite generally, while from the Rocky Mountains westward the readings, as a rule, were somewhat below normal, although locally they were above the average, especially in the north Pacific Coast States.

The distribution of the HIGHS and LOWS was generally favorable for southerly winds throughout the Great Plains, Gulf, and Atlantic Coast districts, but northerly winds were of frequent occurrence in the Ohio Valley and most of the Lake region. There was a tendency to prevailing southerly winds in much of the Rocky Mountain and Plateau districts, although the usual variable winds were in evidence from the Rockies westward to the Pacific.

TEMPERATURE.

About the beginning of the month the cool weather that had prevailed for several weeks over much of the country east of the Rocky Mountains gave way to higher temperatures in many of those districts, especially over the Plains region. Unseasonably cool weather continued, however, in the Rocky Mountain and Plateau districts, and portions of the Pacific Coast States, with light frosts in eastern Oregon and portions of Wyoming on the morning of the 4th. The latter half of the first decade brought considerably higher temperatures to the last-named localities, but at the same time the weather had become unseasonably cool in nearly all districts east of the Mississippi River. The cool weather, however, was of short duration and throughout the second and third decades of the month remarkably warm weather persisted quite generally over the central and northern sections of the country to the eastward of the Rocky Mountains. A tendency to low temperatures for the season of the year was in evidence farther west, particularly during the last decade, when killing frosts and freezing temperatures occurred in the mountainous districts of California and Nevada. In the Atlantic Coast dictricts and generally throughout the South no period of pronounced unseasonble temperatures occurred during the month, the readings being remarkable for their continuously uniform and almost normal values.

For the month as a whole the temperature averaged above the normal from the Rocky Mountains eastward, except in the southeastern States where it was slightly below the normal, while to the westward of the Rockies the month was, as a rule, somewhat cooler than the normal. From the Ohio Valley and Lakes Region westward to the Rocky Mountains the monthly mean values were from 3 to 6 degrees, or, more, above the normal, characterizing the month in some sections as among the hottest Julys on record.

During the last day or two an area of high pressure of moderate intensity moved southeastward from the far Northwest, and at the close of the month cooler weather had overspread nearly all eastern districts.

PRECIPITATION.

Unsettled weather, with scattered showers and thunderstorms, occurred in most eastern and extreme northern sections during the first few days of the month, but no rainfall occurred over large areas in the Rocky Mountain and Plateau districts.

At this time a tropical disturbance was approaching the east Gulf coast, and on the night of the 4th–5th, caused heavy rainfall and easterly gales on the northwest coast of Florida, and as the storm approached the mainland on the 5th the wind reached a velocity of 107 miles per hour at Mobile, Ala., and 104 at Pensacola, Fla. The storm passed inland over Mississippi and moved slowly northward with decreasing intensity, and by the close of the first decade it had practically disappeared over the lower Ohio Valley. This disturbance resulted in heavy rainfall in the east Gulf States, but the rain area was not extensive, being confined principally to the region south of Virginia and Tennessee and east of the Mississippi River. (See also p. 407.) About the 13th another disturbance was indicated off the east Florida coast. This storm moved northward to South Carolina, and thence passed slowly inland in a northwesterly direction, finally disappearing in the Ohio Valley. It caused very heavy and excessive rainfall in the southern Appalachian Mountain districts, resulting in floods that did great damage to property, especially railroad, and caused the loss of a number of lives. At Altapass, N. C., during the passage of this storm, more than 22 inches of rain fell within a period of 24 hours, which is probably the heaviest 24-hour rainfall ever recorded in the United States east of the Rocky Mountains.

During the last half of the month unsettled, showery weather was the rule over much of the country east of the Mississippi River, the rainfall being of specially frequent occurrence and in considerable amounts in the Southeastern States. During the last week of the month good showers occurred over much of the Rocky Mountain section, and the usual summer rains were in evidence in the far Southwest, but the drought continued in the districts from the central Rocky Mountain region eastward to the Mississippi River, being specially severe in Kansas and Missouri.

For the month as a whole the rainfall was particularly heavy in the Southeastern States, where considerable areas received from 15 to 20 inches, or more (see also this

REVIEW for August, 1916); but north and west of a line extending from northern Ohio to central Texas, the totals for the month were generally less than 2 inches, while in considerable areas less than 1 inch occurred during the entire month. In the northern border States and in the far Southwest the rainfall for the month was near the normal, and along the north Pacific coast more than the usual amount occurred.

RELATIVE HUMIDITY.

East of the Mississippi River the relative humidity for the month as a whole was above the normal. The last decade was specially damp and humid over the more eastern districts, resulting in much disagreeable and oppressive weather, even in the absence of unusually high temperatures. This condition was specially pronounced near the Middle Atlantic and New England coasts, where locally the average relative humidity, as recorded at the 8 a. m. and 8 p. m. observations, was almost always between 90 and 95 per cent. Much physical depression resulted from the long period of excessive moisture, while great inconvenience was experienced in protecting food and other products from the damaging effects of the accumulated dampness.

The month was likewise relatively damper than usual on the northern border west of the Great Lakes, and, as a rule, over the Pacific Coast States. Except over the northern border States and along the immediate west Gulf coast, the relative humidity for the month averaged considerably below the normal from the Mississippi Valley to and including the Rocky Mountain districts, and like conditions obtained in the region of the Great Lakes. Much of this area of deficient relative humidity also experienced one of the severest hot and dry periods on record, and the fact that the humidity readings were frequently low during this time modified at least to some extent the physical effect of the unusual heat, but nevertheless much suffering resulted and many deaths and prostrations occurred.

GENERAL SUMMARY.

The outstanding features of the weather of July, 1916, were the excessive and damaging rains that occurred in the Southeast, especially in the southern Appalachian Mountains region, and the persistent and record-breaking hot, dry weather experienced in much of the interior sections of the country to the eastward of the Rocky Mountains. Large areas in the lower Missouri Valley and the central Plains States experienced one of the dryest, if not the dryest, July on record, with almost continuous high temperatures. In fact, throughout all interior districts there was great suffering from the excessively hot weather during the month, especially in the more congested centers of population, where many heat prostrations and deaths resulted, Chicago alone reporting 241 fatalities.

The severe drought in Kansas, Oklahoma, Missouri, and portions of the adjoining States resulted in much damage to growing crops, specially to corn, but at the same time it afforded an opportunity for harvesting and thrashing the small grain crops and securing hay in excellent condition, although the excessive heat interfered to some extent with farming operations, while in some southeastern sections little farm work was possible on account of the frequent showers and wet soil.

From the Rocky Mountains westward the weather during July presented no noteworthy abnormal features, except that in the North Pacific Coast States the month was unusually cool and wet, while moderataly cool weather was the rule in practically all other districts.

LOCAL STORMS.

The following notes of severe local storms have been extracted from reports of Weather Bureau officials:

Pennsylvania.—The warm and humid atmosphere was favorable for the development of destructive local storms that, in some parts of the State, were the worst that have occurred in many years. The loss of life was not great, but the property damage was heavy. In Columbia County a cloudburst on the 27th washed out grades and bridges and caused landslides to such an extent that the loss on the county roads and the railroads was estimated at upward of $100,000, and there was nearly an equal amount of damage to crops. This same county was visited by two other severe storms during the month. At Reading there occurred, on the 21st, the heaviest 24-hour rainfall on record for that place, and it was reported as being the most intense electrical storm that ever visited the city. The damage by flooding of cellars and by lightning was estimated to be $50,000. The storm moved from northeast toward the southwest. Some other localities reporting severe local storms were Pittsburgh, New Castle, Carlisle, Bloserville, York, Stroudsburg, and Mount Pocono.

Minnesota.—Destructive hailstorms occurred during the month over portions of Nobles, Jackson, Murray, and Martin Counties, many farmers reporting the total loss of crops, while numerous losses by lightning were reported. In the northeastern portion of the State, where the rainfall was deficient, the underbrush rapidly dried during the protracted hot weather and many forest fires occurred, some causing considerable damage.

Average accumulated departures for July, 1916.

Districts.	Temperature.			Precipitation.			Cloudiness.		Realtive humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	In.	In.	In.	P. ct.		P. ct.	
New England	69.1	+0.3	− 7.6	4.60	+1.30	+0.80	6.7	+1.6	85	+ 5
Middle Atlantic	75.3	+0.8	+ 5.2	5.17	+0.90	0.00	6.4	+1.5	78	+ 4
South Atlantic	77.8	−1.3	+ 7.9	8.75	+2.70	−5.80	6.9	+1.7	83	+ 3
Florida Peninsula	81.6	−0.3	− 1.8	6.11	−0.30	−8.10	6.0	+1.0	76	− 2
East Gulf	79.1	−1.2	+ 5.4	14.05	+8.70	+1.20	7.0	+1.6	85	+ 7
West Gulf	83.1	+1.2	+ 9.5	2.98	−0.30	−3.50	4.8	+0.7	72	− 2
Ohio Valley and Tennessee	78.6	+2.1	+ 0.1	4.39	+0.40	−0.10	4.7	+0.1	72	+ 3
Lower Lakes	75.9	+4.2	− 3.1	1.04	−2.40	−0.30	4.0	−0.5	69	0
Upper Lakes	73.6	+5.7	− 1.3	1.30	−1.80	+1.50	2.9	−1.7	69	− 3
North Dakota	73.9	+4.8	−13.5	3.54	+0.60	+0.80	3.4	−1.0	72	− 6
Upper Mississippi Valley	81.1	+5.7	+ 1.4	1.07	−2.60	−1.90	3.0	−1.3	65	− 3
Missouri Valley	81.2	+5.5	+ 1.8	1.55	−2.40	−5.40	2.5	−1.7	63	− 3
Northern slope	70.2	+2.1	− 8.7	2.01	−0.40	0.00	3.3	−0.4	55	+ 3
Middle slope	79.4	+2.7	+ 2.9	1.02	−2.00	−2.80	3.0	−1.1	55	− 5
Southern slope	80.8	+0.2	+16.4	1.17	−1.60	−5.10	4.2	−0.3	52	− 7
Southern Plateau	78.0	−1.0	+ 1.4	1.01	−0.20	+1.10	3.6	+0.3	47	+ 9
Middle Plateau	72.1	−0.7	+ 0.2	1.04	+0.60	+0.20	2.3	−0.8	36	+ 4
Northern Plateau	68.6	−2.3	−13.8	0.89	+0.40	+1.80	3.1	+0.4	48	+ 7
North Pacific	60.8	−1.2	− 7.8	2.71	+1.90	−3.70	6.0	+1.4	76	+11
Middle Pacific	65.6	−1.0	+ 0.4	0.37	+0.40	+0.50	1.9	−1.6	59	− 7
South Pacific	68.4	−1.5	+ 0.7	0.00	0.00	+4.50	2.6	−0.2	68	+ 4